Chapter 17. My teaching career

I had some limited teaching experience before I arrived at Indiana University. During my adolescent years in Scotland I taught piano to a few elementary school pupils. This was during the period between leaving high school and waiting to go on Hachshara. This was, if I remember, quite easy, teaching children to recognize the notes on the piano, and how to read music. FACE for the treble spaces, and " Every Good Boy Deserves Favors" (EGBDF) for the treble lines. I don't remember there being any specific catchy notation for the bass clef. I had a few students, and taught very easy pieces of music. I recall that the students would come to the house on Holeburn Rd. where we had an upright piano.

Our house was a typical Scottish sandstone terrace house, built I think in the 1930's We did not have a grand piano, but an old upright placed in the front parlour, among the Victorian bric-a brac and Bergere suite. This was the formal room for visitors, since we had a "living room " facing the back garden for sitting in evenings and it also used as a dining room.

I had been a good student at Hebrew in Sunday school in Glasgow. I even received the " dux" prize, given to the best student in the class. I have this memento of my success to this day, a copy of Valentine's Jewish Encyclopedia, published in 1938. I was awarded this in 1944 at the age of 13. Thus some 14 years later I decided that I should be capable of teaching Sunday school. I applied for such a position at the local Sunday school of a Jewish community in Mountain View, a small town close to Palo Alto. This was in 1961 or 1962. I enjoyed teaching Jewish History and some Hebrew. I carefully avoided religious subjects. Unfortunately my left wing leanings and atheism got me into trouble, and after quoting Karl Marx that "religion was the opiate of the masses" or some such rubbish I was fired. It was an embarrassing situation. One of the students had

reported me to his parents, who then complained to the Rabbi, I must have been stupid and immature.

My third stint of teaching was as a TA (teaching assistant) at Stanford University. I was an instructor in a basic biology lab class taught by Don Kennedy, later head of the US FDA and later still President of Stanford. Since he was a neurobiologist, most of the labs were on electric shocking of frog muscles, and I was only one lab ahead of the class. It was not a good experience, and I was delighted it lasted only one semester. I felt as if I needed an electric shock before each class, and in all honesty had no idea what I was teaching. Somehow I got through the experience. Thus I arrived in Bloomington with minimal teaching experience, and no course in pedagogy. I had to improvise the first courses, and followed very much my mentors at Stanford and Cornell, who would lecture the class with the aid of blackboard, chalk and text books.

Using the black board had its hazards, since I write back hand, and my script had a tendency to slope downward. I was also a terrible artist so that I could not produce good models on the board. Luckily bacteria can be drawn as circles, and bacteriophage as blocks with squiggly tails. I began teaching in the days before computers and power point. I would later purchase slide sets that someone had professionally, produced and this was a great help in lecture. I always tried to make my lectures interesting by telling personal anecdotes or occasional jokes. I did not go as far as to mark " joke goes here" as one of my colleagues did. Occasionally I felt like a performer, and played the role of a stand up comedian.

Later with the advent of power point, and the demise of slides, I was able to produce decent illustrations of principles, lecture outlines, pictures of viruses etc., that made lecturing easier, and more enjoyable. I borrowed power point presentations from other sources, being too lazy to produce them myself. I also found myself depending on power point to guide my lectures. This may have

become monotonous for the students, and a student assistant in education advised me to encourage more student participation in the course The students (mostly seniors) enjoyed this and once a week, usually on Fridays' a small group of 3-4 students would lecture with a visual presentation of the subject. This was during my final years of teaching an advanced virology class, M430. I recently heard a lecture in which the lecturer claimed that power point had destroyed the art of lecturing. I must admit he gave a terrific lecture with out any power point. But this was on a political subject not requiring data.

The first class I was assigned to, following my arrival in the fall of 1967 at IU, was a class in molecular biology (M610). Dr. Drew Schwartz, a well known corn geneticist taught the class using corn genetics as his model system This was during the period when " jumping " genes" or transposons in corn and their molecular activity were discovered. Of course what happened in corn was subsequently discovered in other systems. However there was a lot of excitement in the air.

I was asked to teach the class instead of Drew Schwartz, and I modeled it on the course taught by Charley Yanofsky, my Ph.D. mentor at Stanford. I used as a text "The Genetics of Bacteria and their Viruses" by John Hayes. This was a fantastic book; unfortunately no new edition has been produced in the last few years, but is still available at Amazon for a few dollars. I assume it is considered dated since it was written before the recombinant DNA revolution. As a graduate student this text was the" bible" of bacterial and bacteriophage genetics.

There were between 25-40 students enrolled, mostly graduate students, and I taught the same course during my first few years at IU. A major section of the course was devoted to bacteriophage genetics, the area of my Ph.D. research. Phage genetics was my first love in microbiology and I am today sorry I did not continue research in this field. In fact the first grant I received from the NIH was

for a study of bacteriophage lysogeny, the relationship between the viral chromosome and bacterial chromosome, and the microbiology department originally hired me as a phage geneticist. In retrospect I do not understand why I abandoned this field of research. Was it not glamorous enough or was it too crowded with other young scientists? Certainly many important basic principles of molecular biology were developed from bacteriophage research. Could it have been that I was afraid of competition from Naomi Franklin, with whom I had " crossed swords" at Stanford, and that I did not want to meet with her scientifically again. However I had completed my post-doc in animal virology, and had chosen this field for my future research. Thus after a few years I was persuaded to teach virology, and ironically the phage part of the course was taught by someone else, Dean Fraser.

Possibly I thought animal viruses were more medically important. When it came time to decide on a post -doctoral career, I chose to move into animal virology. Whether I went into the correct lab is something I often think about. I had wanted to join the lab of Renato Dulbecco at La Jolla. Charley, my advisor persuaded me not to do so. He possibly thought the Dulbecco lab was too high powered and that I was not up to it. His argument was that it was a large lab and I would not get personal attention from Dr. Dulbecco. I regret this decision to this day.

Having completed a post-doctoral year in animal virology, (as opposed to bacteriophage and plant viruses) this became my major interest. After a few years at IU, I started co-teaching a general virology lecture class and virology lab with Professor Dean Fraser. Dean taught the phage component, which was about 50% of the material and I taught animal virology. We also established a laboratory course. I introduced tissue culture (cell culture) and Dean taught bacteriophage and

some bacterial genetic techniques. I enjoyed teaching cell culture, this was my forte and I felt truly comfortable teaching these techniques unlike my experience with neurobiology and frogs at Stanford. My relationship with Dean Fraser was cordial, but we were not great buddies. I think he resented this young upstart, whom he thought was quite arrogant and forceful. In fact in a letter I found for either my promotion or tenure dossier Dean described me as aggressive. I think he was annoyed by my requests for more space for research. I was constantly occupying more space each year and " hogging" lots of graduate students. This was a continuous problem, since my projects were exceptionally popular with graduate students and I was the only virologist. This was at the expense of other faculty who were not working in such a popular subject. After a few years I took over the virology course and the lab (M430 and M435) by myself when Dean became chairman of the department of microbiology, a component of the newly created Biology Division.

Dean was much older that I, born in 1916, already in his 50's when I arrived in Bloomington. He had been one of the early pioneers of phage research, and co-discovered how phage DNA entered bacterial cells. He taught an important undergraduate course ' the strategy of life", which introduced modern molecular biology to undergraduates. He also worked with Dr. Henry Mahler of our chemistry department on the mode of replication of T2 bacteriophage.

Dean and his wife Rosemary were very colorful characters. He was very much the non-conformist, lived in a house full of animals including a talking parrot and an iguana. They threw the wildest parties, made " obscene " cookies and I think thought of Mimi and I as being very " square". Rosemary in particular was very uninhibited. I remember her cooking cookies in the shape of men with erect penises. She later opened a store to help artists in the community sell their paintings. Her gallery became a center for art in Bloomington, and many well-

known artists such as Pozzatti, Markman and others sold their art in the store. She was a patron of the Arts. From her obituary "She was predeceased by her parents, her sister Phyllis Debus, two husbands, eight dogs, five cats, an iguana, plus several birds, miscellaneous small mammals, fish, and amphibians." She was born in 1930 in Lawrence Kansas and died in Bloomington in 2009 at the age of 79. Every time I pass by what was her gallery on 6th Street in downtown Bloomington I think of her.

When Dean became chairman of the department he ceased teaching, and so I was responsible for both the lecture and laboratory class in virology. With the help of Judith Surzcycki, an instructor in the department, we thoroughly revamped the lab class, making it 90% mammalian cell culture and animal virus. We had a free hand as to which viruses we could use (this was in the days before the biohazard committees interfered with their restrictions), and we used viruses that typically infected mouse cells, not necessarily mouse viruses and we did occasionally grow herpes simplex virus a potentially human pathogen. Our enrolment in the lab class was limited to 24 students, which was the maximum we could manage given that we had only a few biohazard transfer hoods, essential for the safety both of the students and of the experiments. The conditions in the teaching laboratory were primitive the lab being designed for teaching old fashioned, that is, bench top, bacteriology. It had regular fume hoods but no biosafety hoods for transferring cells in culture and certainly none suitable for virus transfers. We scraped around and found a few discarded biohazard hoods, mostly of a type no longer approved for this type of work by the NIH, thrown out by other labs. Instead of a curtain of air to protect the worker, the filtered air was blown out onto the researcher. Later on, after much urging the department bought a few smaller hoods, with pull down screens to protect the student (and cells), but not sufficient for a class of this size. We often had four students work at the one hood, or the students had to take turns

at using the hood. I don't think the labs on the fourth floor of Jordan Hall had been renovated since built in 1955. In fact it seemed very "Dickensian" and reminded me of my high school in Scotland of the 1940's. The lab was a disgrace and should not have been used, certainly not with potentially hazardous agents. We taught basic cell culture, some immunology, and the high point of the course was the " unknown" virus. Towards the end of the semester we gave a single vial of a unique virus (out of 5-6 different viruses) to the students, and after a few easy exercises they had to discover the correct identity. We gave them a lot of hints and nudges. Each group (usually two although sometimes three students) gave a presentation, mostly quite professional with what was then new technology, first overheads and later power point. It is difficult to think how we managed without these " modern" techniques. The unknown virus was the high point of the course, and the student generally worked very hard to come up with the correct answer, which of course was not based on microscopy of the virus but on its behavior in culture. We did not have microscopes powerful enough to see any virus, for that we would have needed Electron microscopes.

The virology lab class was also taught with two or four teaching assistants depending on the size. While I was on Sabbatical in Italy/Israel, three of the assistants collected the experiments we had developed over the years and with Judy wrote an excellent lab manual. This became the lab manual for the course with modifications added in all subsequent years. In fact Judy and I used this manual until I stopped teaching this class in 2004.

Some intriguing tit bits about the teaching assistants; I had one student from China who could never pass the English proficiency exam. Although he could make himself understood in regular conversation, he was unable to write an essay on the subject asked of him, for example, " What I did on Independence Day "? I think he sat the English exam for foreign students every semester. In order to

obtain the Ph.D. he had to teach at least one semester. When he was close to finishing his Ph.D. research I suggested to the department (or his committee) that he teach in my class, since Judy and I could oversee him as needed. He turned out to be quite a successful instructor, the students had no problem understanding him, and he won the outstanding instructor award of that year (based on student votes). Needless to say he went on to be a highly successful researcher and teacher. So much for the English exam for foreign students!

Another time I was called to the teaching lab in the early hours of the morning. There was a strong smell of alcohol, and the lab doors (two) were locked. The campus police were called and forced open the doors to enter the lab. They found one of the teaching assistants and a few students stretched out on the floor unconscious. One of the female students had to be rushed to Bloomington hospital and treated for alcohol poisoning. Yes, one of my teaching assistants had decided to have a " make up" session and at the same time a cocktail party using lab alcohol as a base. We never found out how many students were involved, but this A.I. was expelled from the microbiology program. I understand he was quite successful elsewhere (Kentucky). I wonder how much of this he recalls. Since this was a mixture of male and female students we often pondered what sort of orgy occurred at the " party."

Judy was a gem to work with. The course would never have worked without her input. She grew all the cells for the course. Originally she had help from Betty Hammel, who maintained the bacterial and cell culture stocks. Later when Betty retired she grew all the cells needed for the class. She pretested most experiments, so that unlike the situation in other lab courses the experiments actually worked. She would spend long hours in the class. Although not required I also spent time in the teaching lab, getting to know the students, and interacting with them. I enjoyed this interaction with " youth". Through this class I was able to recruit a

few students into my lab as either undergraduates or graduate students. In fact one of my best graduate students, Juan Alfonzo, now a professor at Ohio State was a product of this lab.

I continued to teach both virology courses for many years. For the lecture course I developed the course from a number of different textbooks, Luria and Darnell, Virology: White and Fenner (originally Fenner as sole author) Medical Virology, Straus and Strauss, Basic Virology: and later Viruses and Human History by Michael Oldstone. I later used Flint et al, Principles of Virology as a reference. To my surprise the syllabus and lecture outline of the course, as I taught it, is still on the Internet. A Turkish graduate student in Education constructed this web site. As a result of working with Hassan Deniz I introduced as mentioned above student participation every Friday. I think after teaching the course for many years, it become " dry" and needed some changes. Simply, I was bored and I assume that the course must have been boring to students. Hassan urged me to involve the students more and thus we had student presentations. Three students would be assigned a topic, current with the lecture, and would present a power point review of the topic. This worked remarkably well and the student enjoyed the opportunity to teach. This was done weekly and continued when I co-taught the course with my successor, Richard Hardy. Hassan Deniz is currently an assistant professor in education at the University of Nevada in Las Vegas.

After two years of co-teaching Richard Hardy completely took over the course. Richard and I got along very well. He was a much more dynamic teacher than I and this might have reflected our differences in age.

After a career of teaching graduate students and senior undergraduates, I offered to teach freshman!. This was a non-majors course at the 100 level. It was quite a challenge since I had to lower my standards, and prepare an entirely new set of lectures. I choose Viruses and Human History as my subject, following and

expanding on Oldstone's text of that title. I enjoyed the interaction with these young students who came from all " walks of academic life", music physical education, business, psychology etc. Some were exceedingly bright and interested in the material, others were just in the class to meet a biology requirement, and were downright lazy. I tried to make the material more fascinating by introducing short movies, and class participation. The students often were lost in the material and had problems whenever a subject became too biological or chemical. It was a difficult class to teach without including some molecular biology, and this posed a problem to students who never before had a science class. Many seemed to have forgotten their high school biology/chemistry. At times I was disappointed in those who did not even attempt to learn the material and who would receive a 20% on the exam. One year I had a group of " friends" like this, all business majors, and all from Florida. I tried to shame them into working harder, but I am not sure I succeeded. However there were other students who were a joy to work with, particularly among the foreign students.

In summary, I enjoyed teaching. I enjoyed the interaction with the students, and to some extent the play- acting, it was like performing. In order to keep the class interesting I had to come up with spontaneous jokes, move around and prepare slides that would grab attention. In particular in teaching Freshman I had to be a bit of a showman. In fact I have since discovered that I quite enjoy acting in plays and teaching must have satisfied this longing. I never thought of myself as an actor!!

One thing I must add, I had no formal education in teaching. It was just something that came naturally. I have given a few talks this last year on various topics to Emeriti, and laymen, and have had excellent reviews. However I never received any teaching awards. I put this down to the fact that I did not teach the right courses. I should have taught large major undergraduate courses, instead of

very specialized courses. I was exposed to a very small number of students even my final classes in non-majors biology were below 100 students. I never went out of the way to garner any prizes, not asked anyone to nominate me. About that I feel a little bitter.